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AGRICULTURAL BULLETIN

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Gordon R. Groves, Director.

AGRICULTURAL EXHIBITION, 1962

April of 1962 is, in the minds of most people, a long way off. For the Department of Agriculture and Fisheries, however, now is the time when the early plans are being formulated for the twenty-seventh Agricultural Exhibition to be staged next April. The dates of the 1962 Agricultural Exhibition are April 12th, 13th and 14th. This is somewhat earlier than the time normally chosen for the show, but in order to avoid staging the Exhibition on the Easter weekend it was necessary to make this change.

While it is too early to announce definite plans thought is being given to the ring events programme, and other regular features of the show. It will be difficult to improve upon the records established at the twenty-sixth Exhibition, when 15,000 people visited the gardens, and 488 exhibitors took part in the show, but records are made to be broken and we will not be content to look upon 1961 as the "best Exhibition". Our aim is to make the twenty-seventh Exhibition even better! This will only be possible if we get the staunch support of all the organizations and individuals who annually contribute time and effort in the staging of this event.

I. W. H.

ON THE FARMS

After a late summer drought farmers are busying themselves with planting fall crops. Early seedings of carrots have, in many instances, been hit by the dry weather and also by an unusually heavy outbreak of cutworms. There is nothing we can do about the dry weather but there are a number of steps which the farmer can, and should, take to limit the effect of cutworms. First of all, fields which have laid fallow for many months and which are overrun with grass and weeds should be cleared well in advance of the intended planting date. Caterpillars of all types breed in large numbers in overgrown fields. If the grass and weed growth is suddenly turned under and a crop planted it is only natural to expect the countless thousands of caterpillars to feed on anything available rather than starve to death.

By allowing four to six weeks between the time of cultivation of overgrown fields and the time of planting the great majority of the worms that were present will have starved to death.

A further safeguard for plantings of root and cole crops can be achieved by spraying the ground before seeds are sown or seedlings set out. A number of farmers have followed this suggestion this year but many more would be wise to do so.

Locally grown potatoes have been used for seed by farmers wishing to catch an early market. Most of these plantings were made in the middle of September but some were planted as early as the last week in August.

The first shipment of Canadian seed potatoes arrived during the middle of September. Pontiacs are predominant this year but many farmers will plant at least a portion of their land with Triumph seeds.

Ethylene chlorohydrin, the material used to hasten the sprouting of seed potatoes, will be available in the seed stores again this fall. Farmers are reminded that this material is a deadly poison and must be handled with extreme caution.

The Department of Agriculture and Fisheries will be planting potato trial plots at the Botanical Gardens as usual. Farmers are invited to inspect these plots and see how the various varieties and stocks compare with respect to general vigour and resistance to disease.

A new insecticide, Sevin, has been used with great success in the control of the harlequin bug. This highly coloured (black and orange) insect is often troublesome on cole crops, particularly mustard greens. In the past we have found it difficult to get adequate control of the pest with anything but very strong Malathion sprays. However, in trial sprayings, Sevin at the rate of 2 lbs. of the 50% wettable powder gave excellent kill of adult and immature harlequin bugs.

Carlyle Hollis.

GARDEN CALENDAR FOR OCTOBER

October is a very busy month indeed, both in the flower and vegetable gardens.

Seeds of many vegetables sown now will provide a welcome addition to the home table between November and Christmas. Varieties and quantities are too numerous to mention in full, but the following short list may lead your interest further:—Peas, Beans, Carrots, Lettuce, Cabbage, Brussel Sprouts, Cauliflower and Beetroot. Do not make too heavy a sowing at a time of any one subject. Half the pleasure derived from growing your own vegetables is to enjoy their freshness. A glut makes it impossible to use the crop up whilst it is fresh and tender. Sufficient only at one sowing or planting to satisfy needs, coupled with successional sowings, at two-three weekly intervals should be the golden rule.

Seeds of spring flowering annuals should be sown during the month as slightly cooler weather approaches. If beds were prepared and seeds purchased as suggested in earlier bulletins, then everything should be prepared for the pleasure of sowing. Particular care and attention should be given to the young seedlings when they first germinate. At this stage they are most vulnerable to attack by pests and diseases and to the elements of nature. If very dry weather conditions persist, then water must be applied daily to the seed beds. A fine rose should be used with either watering can or hose, whichever is the choice. Tap watering always causes a crustation of the top soil, however. This causes poor aeration of the soil and a loosing-up operation must be carried out regularly. The hoe may be used, but a small hand fork is the best tool, even if back-bending is involved.

Gladiolus planted now will provide flowers in January.

This is an excellent month to commence or complete planting of trees and shrubs.

DONALD J. MOORE,
Superintendent,
Bermuda Botanical Gardens.

BOOK LICE AS HOUSEHOLD PESTS

The sight of a tiny yellow insect scurrying across a page of a book, opened for the first time after having been undisturbed for a long period, is commonly experienced in Bermuda. If one examines this animated speck under a lens one finds a soft bodied insect, often devoid of wings, but otherwise a perfect model of what one would expect an insect to look like. This tiny creature is a book louse and as such belongs to the fairly restricted order of insects known as Corrodentia (Pscocoptera by some authors). Relatives of book lice can be found out-of-doors on the bark of trees or on other vegetation under protected conditions. The out-of-door species usually are winged and often look very much like aphids.

Book lice are cosmopolitan in distribution. Two species are officially recorded from Bermuda but there are probably additional species here. The name book lice has been given these insects because of a superficial resemblance to some chicken lice and because the insects are so often seen in or on books and papers.

Book lice prefer damp, warm, undisturbed situations. For the most part they feed on microscopic moulds. Any situation or commodity which supports mould growth will, therefore, encourage book lice. Some psocids, or book lice, will actually feed on cereals and starchy materials, as well as on the moulds supported by these foodstuffs.

Although book lice may become a great nuisance by crawling in and over everything in the home, they do very little real structural damage. Most of the damage apparent in books infected with book lice is caused by silverfish and cockroaches rather than the book lice.

Psocids have often been reported in great numbers in new homes in Bermuda. Walls and cupboards literally crawl with the insects. This is not surprising when one considers the usual dampness that goes along with a new house. Book lice can reproduce very rapidly under warm conditions such as are prevalent in Bermuda. It would be safe to say that a life cycle can be completed in 4 to 5 weeks during the summer months and probably in two months or so in the winter. At this rate it does not take long for populations of this pest to build up.

The control of book lice is not simple. Since these insects feed primarily on mould growth the first step in a control programme should be the reduction, or, if possible, the elimination of damp mouldy situations in the house. Cupboards and drawers in which these insects are found should be dried out thoroughly and then sprayed with a 2 per cent Chlordane spray or 3 per cent DDT spray. Both of these materials are available as bomb sprays at these concentrations. Flakes of naphthalene or paradichloro-benzene are reported effective in controlling book lice in enclosed areas.

I. W. H.

PLASTICS — A NEW AID IN AGRICULTURE AND HORTICULTURE

by R. J. Collier

Formerly of Shell International Chemical Company

Plastic film, usually of either PVC or polyethylene, is finding new uses in agriculture and horticulture every day. This lightweight, easily transportable and easily fixed material is ideal for temporary protection of crops, which would not normally bear the expense of being protected by glass.

Rather than being considered as a replacement for glass, plastic film should be viewed in its own right, as possessing properties which are not available in other materials. Thus, because of its low cost and ease of handling it is finding an increasing use for temporary structures to protect crops from the weather. In many parts of the world low-growing crops which had previously been protected by heavy and breakable glass cloches are now being covered by plastic film supported on metal or wooden hoops. The process of laying the film can be mechanised by slinging the roll beneath a row-crop tractor and driving the tractor above the crop, the film being reeled out over hoops which have been put in place earlier. Because of the light weight of film, it can be used to cover light wooden structures and placed over such crops as flowers, which must be protected at certain times.

Plastic film is used for lining conventional glasshouses to prevent heat losses during the winter by the formation of an insulating air layer between the glass and the film; this has the added advantage of reducing the light intensity during the summer months and thereby eliminating the necessity of shading, to prevent plant scorch.

Another use for plastic film arises from the increased day-time temperatures and humidity experienced beneath it: for this reason it is often laid on top of grass and other seed to assist germination (the film also prevents damage by birds).

Unfortunately, films of PVC (polyvinyl chloride) or polyethylene become brittle after exposure to sunlight and do not normally last for more than one or two seasons; they also tend to collect dust, are liable to be torn by the wind and being transparent to infra-red rays allow greater heat losses than glass. At present it is unlikely that PVC or polyethylene film will replace glass in conventional glasshouses, although considerable progress has been made in overcoming some of the disadvantages of plastic film, such as including anti-static agents in the film, and certain films, such as those manufactured from polyesters, do not become brittle or torn for a number of years. However, the cost of these films is still too high to compete with glass for conventional glasshouses.

Black Film

To provide maximum possible life, carbon black can be incorporated with the plastic to produce a black film.

Black film laid on the soil surface as a mulch serves a double purpose: weed suppression, and, by reducing evaporation, the conservation of water in the soil. Yields of crops protected by a film mulch can be many times that of an unmulched crop. In addition, in crops such as strawberries, the mulch stops the rooting of runners and prevents the fruit from coming into contact with the soil.

Plastic film provides a very useful means of keeping certain soil fumigants, such as methyl bromide, in the soil during application.

In areas of seasonal rainfall there is often a lack of water during the dry season when it is required for irrigation and stock watering. Until recently, the cost of concrete reservoirs prohibited many growers from considering these for water conservation; but now, by using thick black plastic films to line suitably excavated areas, water can be stored in temporary reservoirs at a cost appreciably below that of a similar concrete structure. In connection with conservation, there is also interest in the use of large numbers of tiny plastic balls to float on the water surface and so reduce evaporation.

Black plastic film is used extensively in the preservation of silage; for this purpose it may be in the form of a large sleeve, which is gradually filled and then sealed at the top. The best type of film for this use is PVC, as it permits the passage outward of carbon dioxide evolved during fermentation but does not allow air to pass back into the silage.

Packaging

Black film is also used for covers for hay-stacks, bagged fertiliser, etc., as liners for irrigation ditches to prevent weed growth and water loss, and to 'force' horticultural crops such as asparagus and bulbs. A considerable market is also developing in the use of black plastic bags in which various seedlings, such as coffee, are grown, before transferring them to the fields.

Clear film is used as a wrapping material for bananas and with the increase of merchandising pre-packed vegetables, many vegetable crops are now packed in plastic bags. Plastic bags are being used in the United States to hold fertiliser, seeds, etc. Although at present they have certain disadvantages compared with multi-wall paper bags, there is no doubt that in time they will become an accepted form of packaging for such materials. Meanwhile, plastic film is used in multi-wall paper bags to make them waterproof.

Pipes

Plastic pipes for transporting water for drinking, for irrigation and for draining soils, are being increasingly used in agriculture and horticulture. The majority of pipe being used for conveying drinking and irrigation water is made from polyethylene and has the advantage over conventional pipes in that it is flexible, easily laid in the soil and does not rust. These pipes are generally coloured, as a clear pipe laid above ground encourages the growth of algae and subsequent discolouration of the pipe. Early plastic garden hose suffered from stiffening at low temperatures, but this is being overcome by altering the formulation of the plastic before extruding the pipe.

Pipes for irrigation may vary between small diameter flexible pipes which can be used to syphon irrigation water from a channel into the lower lying fields, and larger, rigid PVC pipes to transmit the water to sprinklers. Under intensive conditions, flexible pipes can be laid alongside the crops to be irrigated and water released at low pressure through pin-holes in the pipe, so that there is a continual trickle irrigation; this results in less evaporation and compaction of the soil surface than occurs with overhead sprinkler irrigation.

A particularly interesting development has been in the production of plastic soil drains, to replace conventional tile drains and various types of such PVC pipes are being developed in the U.S.A., Finland, Germany, Holland and the U.K. The development of plastic drainage should considerably reduce the cost of draining soils and there seems no reason why plastic drains should not be used as a form of sub-soil irrigation, water being pumped through the pipes during the dry season. Such sub-soil irrigation would mean that considerably less water would be required than for conventional irrigation, as there would be virtually no loss through evaporation; in addition, there would be no compaction of the soil surface.

This technique of sub-soil irrigation has been used in arid areas: first the soil is excavated, then a lining of film is laid in the excavated area, and perforated plastic pipes are placed in the bottom of the excavation before the soil is replaced. By pumping a nutrient solution through the perforated pipes, plant growth is made possible in areas which would not normally support plants.

Dairy Uses

In the dairy industry, plastic pipes are being used to convey the milk to coolers and parts of some milking machines are being made from plastics such as nylon. Considerable thought has been given to the production of plastic milk churns and bottles, but so far no plastic has proved to be completely effective and economic for these purposes.

In the U.K. and other countries polyethylene-coated cardboard containers, in the form of tetrahedrons, are being marketed as a disposable form of milk container. The use of these, however, to replace the traditional heavy, noisy and easily broken glass bottle raises many difficulties. For example, all existing equipment in the milk distribution industry is designed around the glass bottle and would be expensive to replace. However, this problem is gradually being solved and a form of plastic container for milk will become increasingly common.

Plastic film is being used to wrap cheeses during their curing period. This results in a rindless cheese, with subsequent reduction of waste, and since the cheese can be made in a square shape, instead of the conventional round shape, there is a saving in packing space. These cheeses are dispatched to the distributor in the film casing, which enables them to be handled without fear of contamination.

Miscellaneous Uses

In the horticultural market large numbers of clay flower pots are being replaced by plastic pots, made from polyethylene, polystyrene and other plastics. These pots have the advantage over clay pots of being almost unbreakable and light in weight, and being non-porous they require watering less frequently; the smooth interior surface of the pots enables the plants to be lifted out easily.

The excellent heat and cold insulating properties of foamed polystyrene are responsible for its being used extensively in the construction of cold stores for fruit, mea and other perishable goods, and as roof linings in piggeries and hen houses. This material is also used to insulate bulk milk tanks.

Plastic buckets, watering-cans and tanks for knapsack spraying machines are becoming common sights on farms. These articles are light, unbreakable, and not affected by the normal chemicals used on the farms. Plastic pipes, valves and tanks have helped the spraying machinery manufacturer to cut down the weight of his machines without reducing efficiency — an important factor when considering knapsack sprayers.

Corrosion of fertiliser distributors can be even greater than that of spraying machines and in the U.K. and Germany some manufacturers are treating their metal fertiliser distributors with an Epikote* resin based primary paint. This extremely tough paint has excellent adhesion to the metal and gives lasting protection against the chemicals normally used in this type of equipment.

For the future, it may be possible to produce a plastic-coated fertiliser to allow slow release of nutrients for crops such as forests and grass, on similar lines to the 2, 4-D/ plastic pellets now being produced for aquatic weed control.

Other ideas are the use of foamed polyurethane as a growing medium for plants, watered with a nutrient solution, plastic bags to be fitted over fruit when small, to prevent damage by insects (when the fruit is ripe it is com-

pletely pre-packed), bearings on farm machinery that will require no greasing and replacement of certain sheet metal by reinforced plastic (as has already happened in the case of tractor cabs). There is no doubt that eventually plastics will find many new uses on the farm and will become as familiar to the farmer as plastic kitchen items have already become to his wife.

*Epikote is a Shell trade mark.

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RETURN OF PLANT PATHOLOGIST

Mr. Edward Manuel, Plant Pathologist, returned on September 11th from a year of post-graduate study at the Imperial College of Science and Technology, University of London. Mr. Manuel was awarded a scholarship by the Garden Club of Bermuda enabling him to make the trip to the United Kingdom.

While at Silwood Park, the Field Station of the University of London, Mr. Manuel studied in the fields of Plant Pathology, Nematology, Plant Physiology and allied sciences. Work on the various laboratory and field techniques involved in natural sciences, formed an important part of his studies.

As Plant Pathologist with the Department of Agriculture and Fisheries, Mr. Manuel will be responsible for the investigation and control of plant disease problems in the Colony. He will also supervise all plant quarantine programmes and carry out studies on weed control.

WEATHER RECORDING STATION AT BOTANICAL GARDENS

Summary of Climatological data obtained at the Botanical Gardens during September, 1961

Mean Maximum temperature 85.4
Mean minimum temperature 74.1
Mean monthly temperature 79.7
Absolute maximum 87.8 on Sept. 9
Absolute minimum 70.1 on Sept. 2
Rainfall 1.68 inches
No. of rain days 12